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1933/34

DOMINION OF CANADA

DEPARTMENT OF THE INTERIOR

Hon. Thomas G. Murphy, Minister — R. A. Gibson, Assistant Deputy Minister

F. H. Peters, Surveyor General and Director, Topographical and Air Survey Bureau

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ANNUAL REPORT

OF THE

TOPOGRAPHICAL AND AIR SURVEY BUREAU

FOR THE

FISCAL YEAR ENDED MARCH 31, 1934

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TOPOGRAPHICAL AND AIR SURVEY BUREAU

REPORT OF THE DIRECTOR AND SURVEYOR GENERAL, F. H. PETERS

The Topographical and Air Survey Bureau continued during the year its function as a centralized mapping organization by making available for general use that accurate knowledge of the physical features of the country which is so valuable for purposes of development in the unorganized districts and equally valuable for administration in the organized districts. The Survey now has available for distribution about one thousand different map sheets; during the year 69,709 copies of the different sheets were distributed at a nominal price to cover the cost of printing. The distribution of the map sheets includes those produced by the Geographical Section, General Staff, Department of National Defence.

During the year there was assigned to the Survey all the work previously carried on, in another branch of the department, by the Chief Geographer's office. Consequently the Survey now covers the field of geography, such as making a map of the whole Dominion; the field of topographical survey, such as making a very accurate map of an area in one of the highly developed districts; and the field of aerial survey, such as making an accurate map of an undeveloped and unorganized district usually still covered with heavy tree growth.

In June last the further work was taken over of preparing the new set of electoral district maps in accordance with the Representation Act, 1933. This work entails certain difficulties because accurate base maps drawn at a suitable scale are often not available and further difficulties are encountered in certain districts in laying down the accurate boundaries on the maps from the written descriptions in the Act. This latter is a case in point of the assertion made formerly on more than one occasion that it is highly desirable to maintain an intimate connection between the topographical survey and the cadastre. The knowledge which the Survey officers have of the cadastral survey in all of the provinces has been of great assistance in showing the electoral boundaries accurately on the maps. The electoral maps have been further improved by adopting in many cases a larger scale more in keeping with the requirements of the situation.

The work of looking after the legal survey requirements in connection with all Dominion lands was of course continued and, particularly in respect of mineral claim surveys in the Great Bear Lake district of the Northwest Territories, was considerable in amount. Added to this a good deal of work still comes to the Survey in preparing or checking descriptions for deeds and giving information which does not exist elsewhere covering the original land survey in the western provinces.

As might naturally be expected in a country which is so large and yet so young, the diversity of the survey requirements is very great as illustrated by the following few examples of work which has been executed in the course of the past two or three years: mining claim surveys, settlement surveys, surveyed traverse lines to connect and adjust legal and map surveys in the Northwest

Territories and the Yukon; surveys in the Maritimes as a basis for oyster bed leases; a small scale map of Canada; legal boundary surveys for aerodromes in northern Ontario; sheets of National Topographic Map series at different scales at intervals from Vancouver to Halifax; aeronautical strip maps; aerial survey maps of new districts in the north country.

The development of the new technique of making aerial survey maps, in which Canada has taken a leading part, is of more than passing interest because it is true to say that for almost the first time it is possible in one operation to procure the information which will serve every purpose. A modicum of monumented survey is laid down on the ground, the air photographs are taken and from them an accurate base map is produced. The map then serves as an index for accurately locating on the ground all the photographs. Each photograph shows in great detail all the physical features of the ground or its arboreal covering. The map then may be used for purposes of travel or any general study. When the interest narrows to any special spot or area the particular photographs are available for study and exhibit accurately, for instance, details of the forest growth required for a forest inventory; details of a waterfall or reservoir necessary for a water-power study; or details of the rock structure which may be most valuable in connection with geological investigation.

Further information regarding the work accomplished during the year is given under captions referring to the several divisions under which the activities of the branch are organized.

Topographical Mapping

The work carried on by the Topographical Mapping division during the year was similar to that of other years, except that no parties were sent to the field, and that the work formerly done by the Chief Geographer was transferred to this branch, thus adding much additional work to this division.

A large number of the maps issued by the Chief Geographer belonged to what is called the Standard Geographic Map series, which is one of several series of maps that in the past were used for different parts of Canada. Since it is desirable to have the maps of the various other series replaced by maps fitting the National Topographic series as quickly as it is practicable, it has been decided to prepare no new editions of the Standard Geographic Map series but when sufficient information is available to warrant a new edition for any area, the new map will be prepared as one of the National Topographic series. In the meantime reprints will be made of the others as they go out of print.

Since taking over the Chief Geographer's stock of maps one reprint has been made and the following eight-mile maps are being prepared to replace maps of the old series—Charlottetown-Sydney, Fredericton-Moncton, Toronto-Ottawa, Upper Ottawa River, and English River. By co-operation, the Megantic and the Ottawa-Montreal sheets are being prepared by the Geographical Section, General Staff, Department of National Defence.

It is intended to issue the eight-mile map sheets in two editions: one for ordinary popular or civilian use, which will form the base, and the other for air navigation, which will be produced by using a light purple for roads and an overprint in red of the information especially required for air navigation.

In preparing these popular eight-mile map sheets, special attention is given to the classification of the roads in order that they may serve as tourist maps. On account of the extent of country covered by each map, and the great amount of information of the topographical details, these maps are particularly well suited for tourist purposes whether for motorists, railway travellers, canoeists, campers, or other sportsmen.

In addition to the above, work was done on forty-five other map sheets of the National Topographic series, one of the Sectional Map series, and nine

miscellaneous maps. The list at the end of this bureau's report shows those printed during the year and those in hand.

During the year 3,800 place and feature names were investigated, listed, and allocated. Those which were new, duplicated, or contentious, were submitted to the Geographic Board of Canada for consideration. The work of preparing magnetic diagrams was taken over by this division, and was continued for each new map sheet compiled.

In addition to the work done in connection with elevations and levels for our own publications, a number of requests for elevations and levelling information from engineering firms, federal and provincial departments, and individuals were dealt with. The transfer of the Chief Geographer's work necessitated a large amount of extra tabulation, filing of maps, plans, profiles, etc., received from that organization.

Air Surveys

The Topographical and Air Survey Bureau is the centralizing agency for the aerial surveying activities of the Dominion Government, and the work of the division is concerned with the plotting, interpretation, and indexing of the air photographs. It also includes the national aerial photographic library which contains copies of all air photographs taken for the various services of the Government, and serves an important purpose in making available to these services and to the public the wealth of information respecting the physical features of the country which can be obtained by interpretation of the photographs.

Air photography was considerably curtailed during the year 1933-34. The area covered by oblique air photography amounted to 12,000 square miles and a further area of 1,700 square miles was covered by vertical photography. There was also photographed vertically a stretch of shore line about 2,500 miles in length. From this new work, the air photographic library received 12,491 individual photographs, all of which have been indexed. Among the larger users of air photographs, in addition to the Dominion departments, are the departments of Lands and Forests of Ontario and Quebec, the Hydro-Electric Power Commission of Ontario, the Nova Scotia Power Commission, Quebec and Ontario land surveyors, pulp and paper companies, and various mining companies.

The major activity of the division in point of labour involved consisted of the plotting of oblique air photographs and their compilation in four-mile maps of the National Topographic series, and the plotting of vertical air photographs and the compilation therefrom of the two-mile maps of the same series. Line maps showing the topography of stretches of shoreline and routes of rivers along which oblique photography had been obtained on isolated flights were plotted to serve until such time as the map sheet areas involved have been fully photographed.

In the preparation of the eight-mile maps of the National Topographic series, the information obtained from any available photography was incorporated in them to bring them up to date, using methods in keeping with this standard of work. Special maps of areas of particular interest to other services not conforming in boundaries to the National series were also plotted from vertical air photographs. To meet pressing requests of the public for maps of areas under development, some advance sheets of maps under way were prepared and issued to serve until the printed maps in their final form became available.

A few large scale photographic maps or mosaics covering small areas of particular interest along international waterways, canals, power projects and public works, etc., where detailed descriptions were required for administrative or other use, were made to meet special requests from various federal services.

In the course of plotting the air photographs, occurrences of uncommon natural features or other phenomena observed in the photographs are noted for further study or attention by the service affected. In the plotting of oblique photographs taken over northern areas, there were detected in this manner cases of major faulting, occurrences of important intrusive dikes, and indications of areas favourable for prospecting, as well as many illustrations of glacial topographic forms.

A change in the method of obtaining oblique air photography was introduced during the year. Previously the Royal Canadian Air Force aircraft used in oblique photographic operations consisted of a flying boat with a free nose from which the camera was operated. This type of aircraft was replaced by a cabin aircraft equipped with floats, necessitating a change in the camera position and in the manner of taking the photographs as well as allowing for oblique photography at higher altitudes with aircraft of improved performance and providing better working conditions for the camera operator. Positions in the cabin aircraft were located from which overlapping views of the ground below could be obtained with three cameras oriented as in oblique mapping work. The three cameras were established in these positions in fixed relationship to each other and directed to cover the ground passed over and by simultaneous exposures of the three cameras oblique photography of the type desired was obtained. A further development in the rigidity of the camera mounting arrangement is under way. With oblique photography from higher altitudes, the problem of clearing up the background of the photograph and obtaining a sharper record of the visible horizon is introduced. It is proposed to explore the possibility of overcoming this by substituting, for the supersensitized panchromatic emulsion now in use, the more recently developed infra-red emulsion.

The original method of plotting single oblique views introduced in 1923 is still in use, but additional grids or plotting aids necessitated by oblique photography being carried out from higher altitudes, were drawn during the year.

In plotting vertical air photographs, the radial intersection method using the principal point as direction centre, and based on the angular true assumption of radial directions from this point and its corresponding feature on the ground, is still the standard method on two-mile work or larger. In some cases where the relief is low and the quality of the flying good, the application of principal point base traverse methods has amply fulfilled requirements and has been used to speed up delivery of the work with the considerably curtailed staff now available.

The following special plots were turned out during the year additional to the work which is included in the list of map sheets as appearing at the end of the report:—

An area south of Great Slave Lake from the mouth of Taltson River to Fort Reliance was plotted from oblique views, as well as a stretch of the east coast of James and Hudson Bays, about 500 miles in length, extending from Moose River to Richmond Gulf. A stretch of the Liard River about 250 miles in length from the 60th parallel to Simpson, and part of Nahanni River were also plotted from oblique views. Vertical photography over the Duck Mountain Forestry Experimental Area was plotted and compiled for the Forest Service of this department.

Legal Surveys

A year ago the first 124 mineral claims at Great Bear Lake, surveyed under the new four-post staking regulations were reported. These disclosed rather surprising irregularities in the shape of the claims as staked. While the regulations provided for a square of 51·65 acres oriented in cardinal direction, the surveys showed cases of interior angles ranging from 25° to 170°, areas more than double that permitted, and orientations up to 100° in error.

Moreover, the regulations had been interpreted to permit the staking of eight submerged claims from one marginal claim, and this created the necessity of defining witnessed boundaries in cardinal direction to prevent chaos in the survey of submerged claims. Considerable opposition developed to the defining of witnessed boundaries in cardinal direction and, after much discussion, the regulations were reinterpreted to permit the staking of only two submerged claims from one marginal claim, and were amended in May, 1933, to qualify the requirement that the boundaries be astronomically north, south, east, and west. The instructions for survey were immediately revised to require that boundaries partly submerged shall be produced, and submerged boundaries shall in general be parallel to the boundaries on land. These instructions have applied to the survey of 134 claims this season and so far no objections have been raised.

The regulations were further amended to provide that the excess area of over-sized claims might be disposed of under penalty per acre to the owner of the claim, or cut off by the Surveyor General for disposal otherwise. A satisfactory procedure for dealing with such has been evolved and a number have been finally dealt with under this amendment to the regulations.

The mineral claim surveys of 1932 have been examined and approved or returned to the surveyor for amendment and some progress made on the examination of the 1933 surveys, the returns of which were received during the late months of the fiscal year. These disclose even greater diversity in size, the largest exceeding 179 acres of land within the area defined by the four location posts. This is one of a group of 21 claims, 12 of which exceed sixty acres in area, the total excess of the 12 claims amounting to 518 acres. It is hoped that the penalties under which the excess area of claims may be acquired will have a salutary effect upon future staking.

From the Yukon Territory, the returns of four mineral claims were dealt with, also eight and a half miles of resurvey of the base line in Bonanza creek. The original survey had become lost through dredging operations and a revival of interest in the creek and hillside claims rendered necessary the re-establishment of the lines governing their boundaries.

The transfer to the Dominion of the Duck Mountain Forestry Experimental Area in Manitoba necessitated instructions for the survey of the boundaries, and these involved the survey and adjustment of a jog at a correction line where it was affected by a heavy deflection of one of the base lines.

There are many land surveyors who are puzzled about adjusting a jog because the Supplement to the Manual does not explain it, nor furnish a proper table to use; nor does the empirical formula contained in the Manual emit much light. Fundamentally, where no irregularities of survey are involved, the object of the surveyor is to establish, for the Third system of survey, corresponding corners on both sides of the correction line that are on two latitude circles exactly 100 links apart. To do this he must consider the convergence between the corresponding meridian lines from the north and south, which convergence varies with the actual length of the jog and with the latitude of the correction line; it is only necessary to adopt this principle to compute the direction on which to run the trial line, and any surveyor can do this for himself.

In the case in point, the deflection of the base line on the north would produce an excessive width in the road allowance opposite the western end of the jog (85 chains long), so the instructions specified that the township corner on the south side of the correction line should be established 100 links south of the theoretic position of the north side of the correction line in the range to the east, and that the north boundary of section 36 in the range to the west be drawn parallel to this said line, thus making the jog road allowance uniformly 100 links wide for one mile.

The work of surveying intermediate aerodromes or emergency landing field sites on the proposed Trans-Canada airway was continued during 1933. Sites in Ontario were surveyed at Reay, South River, and Emsdale in the Muskoka district; at Round Lake, Ramora, and Porquis Junction on the Temiskaming and Northern Ontario railway; at Smooth Rock Falls, Hearst, Nagomi, Ogahalla, Lamaune, Grant, Collins, Allanwater, Savant Lake, Ycliff, and Sunstrum on the Canadian National railways, and at Kenora on the Canadian Pacific railway, or eighteen sites in all.

On an average these sites are three-quarters of a mile square and are from twenty-five to thirty miles apart. The majority are easily accessible from a railway or an existing highway. These were surveyed for the Department of National Defence by a member of the staff who is qualified to make legal surveys in the province of Ontario.

In the National Parks of Canada, surveys were confined to the laying out of a block of business lots already occupied at Waskesiu in Prince Albert National Park, and a further block of villa lots along Waskesiu lake. Plans of these and all other lots in the park have been prepared.

A number of difficult descriptions of land required by the department were prepared and a considerable volume of correspondence from the public and from officials of the western provinces relating to the surveys and former procedure of the department was dealt with.

In connection with the Saskatchewan Natural Resources Commission, a statement of the cost of surveys in that province was prepared together with a very considerable volume of evidence relating to the policy of the department from time to time in the matter of the selection of lands for subdivision and their disposal.

Something unique in the annals of Canadian surveying, if not in surveying practice the world over, was attempted and carried to a successful conclusion at Cameron Bay on Great Bear lake, Northwest Territories.

The spectacular finds of radium-bearing ore and rich deposits of silver and copper have resulted in no small amount of passenger and freight traffic by air and by water to Great Bear lake. This traffic was destined to converge upon some location that would combine the best facilities for aeroplane and boat landing. By natural selection Cameron Bay was adopted by the flying pilots and by the end of 1932 some eighty people were in residence and were urgently requesting sites for warehouses, shops, restaurant cabins, and all the occupations that go to make up a mining centre, on a rugged projection at the mouth of the bay.

There were no surveys whatever of the locality, but quick action was imperative to prevent chaos and ensure orderly development to whatever extent the community might grow. The surveyor selected to make the survey was the mining inspector, M. Meikle, D.L.S., whose duties for the season took him there. The circumstances did not permit of his taking time to map and study the relief in order to determine a suitable arrangement of allotments that would admit of orderly extension in the future, for barely time enough to lay down the final boundaries of the lots was at his disposal.

It was found that there were two vertical air photographs covering the site, the horizontal scale of which was estimated from the altimeter record. These were placed under the stereoscope and from the height of the trees, shacks, and other objects visible, the relief was estimated and contours at ten-foot intervals were drawn upon them. The shore line and contours were then traced, enlarged about four times to a scale of 200 feet to an inch, and studied to ascertain an arrangement of lots to which proper access could be obtained on roadways of reasonable gradient. The resulting design was furnished to Mr. Meikle as a

guide plan along with general and specific instructions for its use and for laying out and monumenting the boundaries of the lots required.

As this method was without precedent, and therefore somewhat experimental, it was decided to send the surveyor one of two duplicate marked photographs with a grid superimposed for ready reference to points and instruct him to make careful measurements on the ground between certain marked points to determine the actual scale of the map and run certain lines of levels as a check upon the accuracy of the contouring and on the estimated height of the hills. This was done at the initial stage of the survey and the full data were transmitted to Ottawa by wireless message where it was plotted. The result showed the scale of the guide plan to be approximately 194 feet to an inch instead of 200 feet, or an error of only three per cent, and the estimated height of 180 feet for the highest hill to be 30 feet too low. The contours in general checked well on the levelled lines. This assured that no real obstacle would be encountered in fitting the design to the ground.

Mr. Meikle found time to lay out and monument 110 lots for occupation. While he was instructed to fit his subdivision to the ground his plan of survey shows only minor deviations from the lay-out based upon the air photographs.

Special Surveys

Electoral Maps.—During the year the work of this division consisted largely of the preparation of a new set of electoral maps based upon the Representation Act of 1933. This work was formerly done by the National Development Bureau, but was transferred to this branch early in the year.

The purpose is to show as clearly as possible, in map form, the exact limits of each electoral district. In order to do this the most suitable existing maps are required, and these have been obtained; mostly, these were maps produced by this department, but some maps of other federal mapping organizations were used, as well as those of provincial governments, and city maps prepared by the various municipalities. The limits of the electoral districts as defined in the statute are plotted on these maps, doubtful cases investigated and, where the intention of the Act is not clear, submitted to the Chief Electoral Officer for a ruling under section 4 of the Act. The part of each map required to show an electoral district is then prepared for reproduction by photography, and from the photographic negative blue line prints are made as required.

The separate prints made available by this process consist of a print of each province showing the electoral districts in that province, and a print of each electoral district on a suitable scale. Besides these, prints have been prepared from city maps showing the electoral district boundaries in the cities of Montreal, Toronto, Calgary, and Vancouver.

Altogether, 257 separate maps have been prepared, from which blue line prints can be made as desired. The distribution of these maps has also been handled from this division.

Computations.—The mathematical investigations and computations necessary to enable the Drafting division to lay down two new projections were done during the year. One of these maps is being produced at the special request of the Meteorological Service of Canada, as a base map for showing meteorological information, and is in accordance with the recommendations of an International Conference of Meteorologists; the other is being prepared at the special request of the Director of Civil Aviation and is designed to facilitate the study of trans-Pacific air flights.

Other computational work included the preparation of the usual astronomical field tables to facilitate the determination of azimuth by observing on the Pole Star, and the preparation of diagrams and observing lists to facilitate the

determination of latitude and longitude by different methods of observing. A large amount of miscellaneous mathematical and computational work, such as is incident to the work of any large survey and mapping organization was also performed in this division.

Survey Records and Distribution Division

During the year the work of this division was largely increased by taking over from the National Development Bureau the custody and distribution of the maps formerly distributed from that office. These maps include the various sheets of the Standard Geographic series on scales of 3·95 and 7·89 miles to an inch, and all the general maps of the Dominion of Canada and the separate provinces. With the addition of these maps there are now available for distribution from this bureau about 1,000 different maps, about 100 reports and pamphlets, and about 7,000 official plans of townships, townsites, and settlements.

During the year 75 books of field notes and 395 plans were received and entered in the various registers. On completion of the examination, the books and original plans are placed on record. The signed copy of each official plan issued and one copy of each map issued are also recorded. During the year 112 new field books and 125 plans and maps were placed on official record. To date, 21,747 books and 38,653 plans and maps have been so recorded.

The work of dealing with requests for technical information relating to surveys, survey records, and official plans was carried on as usual. Requests are received from various branches of the federal and provincial governments, surveyors and engineers, law firms, and the general public, and relate to survey monuments, conflicting boundaries, etc. This involves not only the searching of the surveyors' field notes and files but in many cases, the supplying of copies of the notes and plans. When required for the law courts the copies of the notes and plans are officially certified. The number of technical requests and letters dealt with during the year was 378.

The number of copies of official plans of townships, townsites, and settlements distributed during the twelve months was 39,378. During the past year there were distributed 69,709 maps and 3,568 copies of publications. In the distribution of these, 19,624 requests were dealt with. A comparative statement of the distribution of maps, plans, and publications for the five-year period ending March 31, 1934, follows:—

—	Number of requests	Official plans distributed	Maps distributed	Publications distributed
1929–30	13,360	13,630	68,819	6,026
1930–31	12,087	31,690	48,218	4,282
1931–32	10,988	12,860	38,822	2,993
1932–33	16,235	25,525	51,299	3,329
1933–34	19,624	39,378	69,709	3,568

Map Publication

The statement at the end of this part of the report, showing the list of maps issued and in course of preparation, is indicative of the work of the map publication division since some work was done in the division on most of the maps listed.

The drafting section makes the finished drawings, and adds the titles, footnotes, legends, and place-names in appropriate type. Approximately 6,500 place-names, elevations, and symbols were so set up and used during the year.

A folder cover is prepared for each new map giving some pertinent information about the district mapped and also giving an index and key of the place-names appearing on the map. Nineteen maps (approximately 500 copies of each) were put up in these folder covers. Seventeen certificates for the Board of Examiners for Dominion Land Surveyors were engrossed.

This division took over the drafting of the Federal Electoral Maps, work formerly done in another branch of the department. During the year these maps were prepared for the photographer who made vandyke negatives of them. These negatives may be used for making up any required number of blueprint copies.

The photo-mechanical section continued to photograph the finished drawings and prepare the zinc printing plates. Assistance was also given to the compiling and drafting work of the office by reproducing working enlargements or reductions of manuscript maps and drawings of various sorts. Considerable work of this sort was done for other branches of the department and for other departments.

This division has a very fine enlarging camera: in fact it is probably the best in Canada. The design and all the drawings for it were made in the office while the contracts for the various parts were let locally. It has been several years in building and still requires a proper metal copy board before it can be considered complete. In the meantime a wooden board is being used in order to enable the camera to be utilized for work.

The blue printing and photostat work formerly done by another branch of the department was transferred to this office during the year and the equipment moved and installed ready for work. This work is done for other branches of the department and for other departments.

The detailed statement of the photographic work of the division follows:—

	Number
Wet plate negatives	1,706
Photo-litho plates	352
Line and half-tone cuts	122
Intaglio plates	11
Plotting grids	144
Enlargements and prints	382
Vandyke prints from negatives	2,753
Photostat—sheets	2,883
Blue printing—square feet	70,369
Blue printing, linen—square feet	174
Vandyke printing—square feet	3,798

The list of maps issued during the year shows those printed in the lithographic division. Approximately 92,500 copies, necessitating 330,000 impressions, were turned out. This division now has the custody of the copper plates from which the Standard Geographic series, 3·95 and 7·89 miles to an inch, and the general maps of the Dominion of Canada and the various provinces, were printed. These plates are carefully preserved and are being used in the work of the office.

Board of Examiners for Dominion Land Surveyors

The Board of Examiners for Dominion Land Surveyors held two meetings during the year. The first was a special meeting lasting from Monday, May 1, 1933, to Monday, June 5, 1933, during which examinations were held at Ottawa, Montreal, and Edmonton. The second was a special meeting held on Wednesday, January 31, 1934.

The total number of candidates who presented themselves at the examination was 26. Of these, 7 tried the Preliminary examination, 3 tried the Final examination and 16 tried the examination for levellers.

One candidate was successful at the Preliminary examination as follows: W. K. MacDonald.

Two candidates were successful at the Final examination as follows: W. P. Dunbar and J. H. Holloway.

Eleven candidates were successful at the Levellers' examination as follows:

Christie, A. M.	Juzenko, C. J.	Smith, O. H.
Clarke, T. R.	Lockhead, D. R.	Swift, J. W.
Cole, A. H.	Musson, G. A.	Taylor, J. H.
Foster, I. M.	Rice, J. D.	

LIST OF MAP SHEETS OF THE NATIONAL TOPOGRAPHIC SERIES ISSUED 1933-34, AND IN HAND ON MARCH 31, 1934

ISSUED 1933-34

Prov.	No.	Series	Name	Scale	Latitude	Longitude	Remarks
N.S.	20-P/NW	N.T.	Shelburne	2	43° 30′ to 44° 00′	65° 00′ to 66° 00′	(b)
Que.	21-L/NW	N.T.	Quebec	2	46° 30′ to 47° 00′	71° 00′ to 72° 00′	(a)
	31-J/SW	N.T.	Maniwaki	2	46° 00′ to 46° 30′	75° 00′ to 76° 00′	(b)
	31-K/SE	N.T.	Gracefield	2	46° 00′ to 46° 30′	76° 00′ to 77° 00′	(b)
	31-K/NE	N.T.	Tomasine	2	46° 30′ to 47° 00′	76° 00′ to 77° 00′	(b)
	31-P/SE	N.T.	La Tuque	2	47° 00′ to 47° 30′	72° 00′ to 73° 00′	(b)
	32-C/SW	N.T.	Senneterre	2	48° 00′ to 48° 30′	77° 00′ to 78° 00′	(b)
Ont.	31-E/SW	N.T.	Muskoka	2	45° 00′ to 45° 30′	79° 00′ to 80° 00′	(b) revised edition
	42-L	N.T.	Nakina	4	50° 00′ to 51° 00′	86° 00′ to 88° 00′	(b)
	52-E	N.T.	Kenora	4	49° 00′ to 50° 00′	94° 00′ to 96° 00′	(b) revised edition
	52-K	N.T.	Lac Seul	4	50° 00′ to 51° 00′	92° 00′ to 94° 00′	(b) revised edition
Man.	63-O	N.T.	Nelson House	4	55° 00′ to 56° 00′	98° 00′ to 100° 00′	(b)
	64-C	N.T.	Granville	4	56° 00′ to 57° 00′	100° 00′ to 102° 00′	(b)
Sask.	64-D	N.T.	Reindeer Lake South	4	56° 00′ to 57° 00′	102° 00′ to 104° 00′	(b)
	73-H	N.T.	Prince Albert	4	53° 00′ to 54° 00′	104° 00′ to 106° 00′	(b)
	74-B	N.T.	Mudjatik	4	56° 00′ to 57° 00′	106° 00′ to 108° 00′	(b)
Alta.	82-J/16	N.T.	Calgary Southwest	1	50° 45′ to 51° 00′	114° 00′ to 114° 30′	(a) reprint
B.C.	82-N/SW	N.T.	Glacier Park	2	51° 00′ to 51° 30′	117° 00′ to 118° 00′	(a)

IN HAND MARCH 31, 1934

P.E.I.	S½ 11/NW N½ 11 SW	N.T.	Charlottetown-Sydney	8	45° 00′ to 47° 00′	60° 00′ to 64° 00′	(b)
N.S.	11-E/SE	N.T.	Sunnybrae	2	45° 00′ to 45° 30′	62° 00′ to 63° 00′	(b)
	21-A/NE	N.T.	Chester	2	44° 30′ to 45° 00′	64° 00′ to 65° 00′	(b)
	21-A/SE	N.T.	Bridgewater	2	44° 00′ to 44° 30′	64° 00′ to 65° 00′	(b)
N.B.	21-H/SW	N.T.	St. Martins	2	45° 00′ to 45° 30′	65° 00′ to 66° 00′	(b)
	21-I/SW	N.T.	Chipman	2	46° 00′ to 46° 30′	65° 00′ to 66° 00′	(b)
	21-I/NW	N.T.	Newcastle	2	46° 30′ to 47° 00′	65° 00′ to 66° 00′	(b)
	21-O/NE N½ 21/SE	N.T.	Campbellton	2	47° 30′ to 48° 00′	66° 00′ to 67° 00′	(b)
	S½ 21/NE	N.T.	Fredericton-Moncton	8	45° 00′ to 47° 00′	64° 00′ to 68° 00′	(b)
Que.	31-F/NE	N.T.	Fort Coulonge	2	45° 30′ to 46° 00′	76° 00′ to 77° 00′	(b)
	31-G/NE	N.T.	Lachute	2	45° 30′ to 46° 00′	74° 00′ to 75° 00′	(b)
	31-I/NE	N.T.	Grand Mère	2	46° 30′ to 47° 00′	72° 00′ to 73° 00′	(b)
	31-J/SE	N.T.	Ste. Agathe	2	46° 00′ to 46° 30′	74° 00′ to 75° 00′	(b)
	31-J/NW	N.T.	Mont-Laurier	2	46° 30′ to 47° 00′	75° 00′ to 76° 00′	(b)
	31-N/NE	N.T.	Vimy	2	47° 30′ to 48° 00′	76° 00′ to 77° 00′	(b)
	31-O/NW	N.T.	Choquette	2	47° 30′ to 48° 00′	75° 00′ to 76° 00′	(b)
	32-B/SW	N.T.	Bourmont	2	48° 00′ to 48° 30′	75° 00′ to 76° 00′	(b)
	32-C/SE	N.T.	Doucet	2	48° 00′ to 48° 30′	76° 00′ to 77° 00′	(b)
	32-B	N.T.	Gouin Reservoir	4	48° 00′ to 49° 00′	74° 00′ to 76° 00′	(b)
	32-F	N.T.	Waswanipi	4	49° 00′ to 50° 00′	76° 00′ to 78° 00′	(b)
	31-NW	N.T.	Upper Ottawa River	8	46° 00′ to 48° 00′	76° 00′ to 80° 00′	(b)

LIST OF MAP SHEETS OF THE NATIONAL TOPOGRAPHIC SERIES ISSUED 1933-34, AND IN HAND ON MARCH 31, 1934—*Concluded*

IN HAND MARCH 31, 1934—*Concluded*

Prov.	No.	Series	Name	Scale	Latitude	Longitude	Remarks
Ont.....	31-F/7	N.T..	Renfrew.....	1	45° 15′ to 45° 30′	76° 30′ to 77° 00′	
	31-L/13	N.T..	Timagami.....	1	46° 45′ to 47° 00′	79° 30′ to 80° 00′	
	31-E/NE	N.T..	Algonquin.....	2	45° 30′ to 46° 00′	78° 00′ to 79° 00′	(b)
	31-L/SW	N.T..	North Bay.....	2	46° 00′ to 46° 30′	79° 00′ to 80° 00′	(b)
	42-I/SW	N.T..	Coral Rapids.....	2	50° 00′ to 50° 30′	81° 00′ to 82° 00′	(b)
	42—I/NW	N.T..	Blacksmith Rapids...	2	50° 30′ to 51° 00′	81° 00′ to 82° 00′	(b)
	52-A/SW	N.T..	Fort William-Port Arthur.....	2	48° 00′ to 48° 30′	89° 00′ to 90° 00′	(b)
	52-A/NE	N.T..	Black Bay.....	2	48° 30′ to 49° 00′	88° 00′ to 89° 00′	(b)
	52-A/NW	N.T..	Kaministikwia.....	2	48° 30′ to 49° 00′	89° 00′ to 90° 00′	(b)
	52-H	N.T..	Nipigon.....	4	49° 00′ to 50° 00′	88° 00′ to 90° 00′	(b)
	31-SW	N.T..	Toronto-Ottawa.....	8	44° 00′ to 46° 00′	76° 00′ to 80° 00′	(b)
	52-NW	N.T..	English River.....	8	50° 00′ to 52° 00′	92° 00′ to 96° 00′	(b)
Man.....	62-J	N.T..	Neepawa.....	4	50° 00′ to 51° 00′	98° 00′ to 100° 00′	(b)
	62-O	N.T..	Gypsumville.....	4	51° 00′ to 52° 00′	98° 00′ to 100° 00′	(b)
	63-C	N.T..	Swan River.....	4	52° 00′ to 53° 00′	100° 00′ to 102° 00′	(b)
Sask.....	63-L	N.T..	Amisk Lake.....	4	54° 00′ to 55° 00′	102° 00′ to 104° 00′	(b)
	64-E	N.T..	Reindeer Lake North.	4	57° 00′ to 58° 00′	102° 00′ to 104° 00′	(b)
	64-L	N.T..	Wollaston Lake.....	4	58° 00′ to 59° 00′	102° 00′ to 104° 00′	(b)
	74-N	N.T..	Tazin Lake.....	4	59° 00′ to 60° 00′	108° 00′ to 110° 00′	(b)
	74-O	N.T..	Fond du Lac.....	4	59° 00′ to 60° 00′	106° 00′ to 108° 00′	(b)
	74-P	N.T..	Stony Rapids.....	4	59° 00′ to 60° 00′	104° 00′ to 106° 00′	(b)
Alta.....	74-E/SW	N.T..	McKay.....	2	57° 00′ to 57° 30′	111° 00′ to 112° 00′	(b)
	74-E/NW	N.T..	Firebag.....	2	57° 30′ to 58° 00′	111° 00′ to 112° 00′	(b)
	82-O/NW	N.T..	Barrier Mountain.....	2	51° 30′ to 52° 00′	115° 00′ to 116° 00′	(a)
	82-O/SW	N.T..	Banff.....	2	51° 00′ to 51° 30′	115° 00′ to 116° 00′	(a)
	84-H/NE	N.T..	Ells River.....	2	57° 30′ to 58° 00′	112° 00′ to 113° 00′	(b)
	84-H/SE	N.T..	Namur.....	2	57° 00′ to 57° 30′	112° 00′ to 113° 00′	(b)
	73-L.....	N.T..	Lac-la-Biche.....	4	54° 00′ to 55° 00′	110° 00′ to 112° 00′	(b)
B.C.....	92-L/1	N.T..	Shoan Lake.....	1	50° 00′ to 50° 15′	126° 00′ to 126° 30′	(a)
	92-L/2	N.T..	Woss Lake.....	1	50° 00′ to 50° 15′	126° 30′ to 127° 00′	(a)
	92-L/6	N.T..	Alice Lake.....	1	50° 15′ to 50° 30′	127° 00′ to 127° 30′	(a)
	92-L/7	N.T..	Nimpkish.....	1	50° 15′ to 50° 30′	126° 30′ to 127° 00′	(a)
	92-L/8	N.T..	Adam River.....	1	50° 15′ to 50° 30′	126° 00′ to 126° 30′	(a)
	92-L/10	N.T..	Alert Bay.....	1	50° 30′ to 50° 45′	126° 30′ to 127° 00′	(a)
	93-A/12	N.T..	Hydraulic.....	1	52° 30′ to 52° 45′	121° 30′ to 122° 00′	(a)
	82-L/NW	N.T..	Shuswap.....	2	50° 30′ to 51° 00′	119° 00′ to 120° 00′	(a)
	82-L/SW	N.T..	Vernon.....	2	50° 30′ to 51° 00′	119° 00′ to 120° 00′	(a)
	92-F/NW	N.T..	Comox.....	2	49° 30′ to 50° 00′	121° 00′ to 122° 00′	(a)
	92-G/SE	N.T..	Port Moody.....	2	49° 00′ to 49° 30′	122° 00′ to 123° 00′	(a)
	92-G/SW	N.T..	Vancouver.....	2	49° 00′ to 49° 30′	123° 00′ to 124° 00′	(a)
	92-L/SE	N.T..	Nimpkish Lake.....	2	50° 00′ to 50° 30′	126° 00′ to 127° 00′	(a)
	92-L/NW	N.T..	Port Hardy.....	2	50° 30′ to 51° 00′	127° 00′ to 128° 00′	(b)
	93-K/SE	N.T..	Fraser Lake.....	2	54° 00′ to 54° 30′	124° 00′ to 125° 00′	(b)
	102-I/NE	N.T..	Cape Scott.....	2	50° 30′ to 51° 00′	128° 00′ to 129° 00′	(b)
N.W.T..	55-K	N.T..	Rankin Inlet.....	4	62° 00′ to 63° 00′	92° 00′ to 94° 00′	(c)
	55-L	N.T..	Ferguson River.....	4	62° 00′ to 63° 00′	94° 00′ to 96° 00′	(c)

NOTES.—Work performed on those sheets marked "In Hand" ranges throughout the various stages from the commencement of the compilation in the office to the preparation of the final lithographic plates for printing. Some sheets upon which very little work has so far been done are not included in the above list.

Where a map sheet extends into more than one province, it is listed under one province only.

Under the column of "Remarks" the following are the meanings attached to the symbols used:—

(a) National Topographic Series—Standard Edition—Topographical information complete.

(b) National Topographic Series—Provisional Edition Topographical information complete or nearly so (except for contours), over all or greater portion of sheet.

(c) National Topographic Series—Exploratory Edition—Topographical information from exploration surveys, or where control is inadequate, no contours or contours conjectural only.

LIST OF MISCELLANEOUS MAP SHEETS AND PLANS ISSUED 1933-34 AND IN HAND MARCH 31, 1934

Issued 1933-34

Province	Map	Scale	Remarks
N.S.	Truro standard sheet	3·95	Reprint.
N.B.	Plan of Shediac bay showing oyster leases	1,000 feet	For Department of Fisheries.
Que.	Index to maps of National Topographic series for Quebec and the Maritime Provinces	50	Reprint.
	Fort Coulonge—4 quarters	1	Advance information.
	Ste. Agathe—3 quarters	1	Advance information.
Ont.	Sudbury	2	Provisional edition.
	Index to maps of National Topographic series	50	Reprint.
Man.	Churchill and vicinity	1	
	Map of province showing place names	.....	For Geographic Board of Canada.
	Map of province showing areas likely to be infested with grasshoppers, 1934	.....	For Department of Agriculture.
	Wasagaming settlement		
Sask.	Map of province showing areas likely to be infested with grasshoppers, 1934	.....	For Department of Agriculture.
N.W.T.	Sheet No. 2, Northwest Territories	35	
	Belcher Islands	4	Provisional edition.
	Northwestern Canada	.....	Reprint.
	Cameron Bay townsite, Great Bear lake		
	Index to maps of Northwest Territories		
Misc.	87 official township plans	40 chains	56 were reprints.
	Index to three-mile sectional maps	.....	Reprint.
	Map of Prairie Provinces showing elevators	.....	For Department of Agriculture.
	Ucluelet and Sooke Harbour charts	.....	For Department of Marine.
	Base map of Prairie Provinces	.....	For Bureau of Statistics, Department of Trade and Commerce.

In Hand March 31, 1934

Province	Map	Scale	Remarks
Que.	Chicoutimi district	2	
	Index of maps of National Topographic series in Quebec and the Maritime Provinces	50	
Ont.	Index of maps of National Topographic series	50	
Sask.	Saskatchewan South	12·5	Showing contours.
	Saskatchewan South	16	Revision of 12·5 mile map.
	Moose Jaw-North Battleford	8	Aerial navigation map.
	Medicine Hat, N.M. 12	1/1,000,000	International map of the world.
Alta.	Jasper Park North	3	
	Jasper Park South	3	
N.W.T.	Great Bear lake	8	Revision.
	Liard river	8	
Misc.	Tourist map of Canada	40	
	Meteorological map of Canada	157·8	
	Map of Canada	100	
	North Pacific ocean	250	

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LIST OF MISCELLANEOUS MAP SHEETS AND PLANS ISSUED DURING AND IN HAND AT MARCH 31, 1924

(Corrected to March 31, 1924)

Province	Map	Scale	Remarks
N.S.	Plan of Sydney Harbour	2 in.	Surplus.
N.B.	Plan of Shediac Bay showing oyster leases	1,000 ft.	For Department of Fisheries.
Que.	Index to sheets of Natural Topographic series for Quebec and the Maritime Provinces	40	General.
	Plan Saguenay Quebec	1	Private information.
	Ste. Agathe-des-Monts	1	Private information.
Ont.	Sudbury	2	Price placed on sheet.
	Index to maps of Natural Topographic series	10	Revised.
Man.	Churchill and vicinity	1	
	Map of provincial forest plots issued		For Commercial Board of Canada.
	Map of certain districts issued [illegible] Alberta, with compilation, 1924		For Department of Agriculture.
Sask.	Map of certain districts issued [illegible] Saskatchewan, 1924		For Department of Agriculture.
N.W.T.	Sheet 105 J, Norman Territories	4	
	Caribou Islands	1	Provisional edition.
	Northern Ontario		Revised.
	Index to sheets of Natural Topographic series	10	
Misc.	Index to sheets of Natural Topographic series	10	10 sheets issued.
	Index to Geological maps		Revised.
	Mining Fields Map, and Revised provisional		For Department of Mines, Ottawa.
	Victoria and Esquimalt Harbour Plan		For Department of Marine.
	Plan, map of Dredge Operations		For Minister of Railways, Department of Public Works and Canals.

To Date March 31, 1924

Province	Map	Scale	Remarks
Que.	Index to sheets of Natural Topographic series	10	
	Index to sheets of Natural Topographic series	10	
	Gaspé Peninsula, Quebec	10	
Ont.	Index to sheets of Natural Topographic series	10	
Sask.	Saskatchewan River	10	Survey [illegible]
	Saskatchewan South	10	Revision of 1913 with [illegible]
	Shoal Lake North Sheet[illegible]	1	Index to [illegible]
	Sheet 105 J, N.W.T.	4	
	Pacific Ocean, N.W. [illegible]	1,000,000	International size of the world.
Alta.	Peace River, Alberta	4	
	Jasper Park Sheet	1	
	Mount Robson Sheet	1	
B.C.	Coast Sheet No. 1	10	Provisional.
	Lillooet Sheet	4	
Misc.	Outline map of Canada	10	
	Meteorological map of Canada	107	
	Map of Canada	100	
	Map of Canada	100	